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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,111

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EXAMINER

WU, VICKI H

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/591,111	Applicant(s) HENNE ET AL.	
	Examiner VICKI WU	Art Unit 4122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☒ Claim(s) 16-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/31/2006, 2/15/2007</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group 1 (Claims 1-15) in the reply filed on 2/13/2009 is acknowledged. Claims 16-20 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected methods for producing a multi-layer composite and/or producing a fiber—reinforced plastics material, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 2/13/2009.

Claim Objections

Claim 15 objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered. See MPEP § 608.01(n). Accordingly, the claim 15 not been further treated on the merits.

Rejection under 103(a)

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2. The following is a quotation of 35 USC 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-11 are rejected under USC 103(a) as being anticipated by the admitted prior art Dunton et al. (5,482,667) (Dunton) in view of the admitted prior art Winckler et al. (6,420,047) (Winckler).

Regarding the limitations of Claims 1-2, Dunton teaches a method of producing fiber-reinforced material by coating / impregnating melted thermoplastic resin (PBT, PET, or a PET/PBT blend) onto the surface of a fiber mat core, then coating or extruding an outer layer of PET onto the previously-coated fiber mat core in an extrusion zone, and finally compression-molding said twice-coated article (column 2 lines 1-20, 35-65; column 6 lines 5-10).

Regarding the limitations of Claims 3-6, Dunton teaches that the outer layer of the twice-coated fiber-reinforced article was applied in molten form (preferably pure and free of any form of fillers / reinforcing agents) via extrusion and may be comprised of PBT, PET or a PET/PBT blend (column 2 lines 55-65; column 6 lines 1-20; Table of First / Second Resins; column 7 lines 15-20; column 8: Claim 1).

Regarding the limitations of Claim 7, Dunton teaches a continuous process for producing the fiber-reinforced thermoplastic resin articles (column 1 lines 115; column 2 lines 1-5; column 8: Claim 1; Figure 1). It would be obvious to one with ordinary skill in

the art at the time the invention was made to reason said articles are produced in line with a supply of starting materials, including the fiber mat core structures.

Regarding the limitations of Claims 8-10, Dunton teaches that the fiber mat core structures are impregnated/ coated in line with PET or PBT material, and supplied and used continuously in the process of manufacturing fiber-reinforced thermoplastic resin articles, wherein they are coated in line on one or both sides with an outer layer (in the form of an extruded film) and pressed in line in a feed-through press (column 2 lines 1-20, 35-40, 55-65; Figure 1).

Regarding the limitations of Claim 11, Dunton teaches that the fiber mat core structure may be extruded / coated with the second, outer layer only partially on its surface, indicating that when compressed in the molding tool cavity, the first coat of resin (comprised of PET or PBT) may coat the inside wall of the cavity.

Regarding the limitations of Claims 1-2, Dunton does expressly disclose that the first coating material may be comprised of reactive cyclic/macrocyclic oligomers of polyester, in order to react with the outer layer of the fiber-reinforced material.

Winckler teaches the method of creating a blend material comprised of macrocyclic polyester oligomers of PBT (polybutylene tetraphthalate) or PET / PBT (polyethylene tetraphthalate) with a polymerization catalyst, in order to use said blend material to produce articles using injection/rotational/compression molding, resin film infusion, etc. (Column 3 lines 30-60; column 5 lines 40-50; columns 21-22 part g).

It would have been obvious to one with ordinary skill in the art at the time the invention was made to incorporate the disclosed blend material of reactive oligomers

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and polymerization catalyst of Winckler into the process of initially coating a fiber mat core of Dunton, so that the applied outer layer would polymerize and bond with said blend. The rationale to do so would have been that the blend material of Winckler has superior processing characteristics relative to conventional thermoplastics precursors, with a stable and long shelf life, and allowing for easy production, storage, transportation and processing (Winckler: column 3 lines 30-40). By incorporating said blend material of Winckler into the manufacturing process of Dunton, the durability and longevity of the finished fiber-reinforced material of Dunton may be increased.

Regarding the limitations of Claims 3-6, Dunton does not expressly disclose that said PET or PBT material comprises reactive starting material.

Winckler teaches a blend of reactive starting material (comprised of macrocyclic polyester oligomers of PBT or PET, with catalyst) used to manufacture thermoplastic resin articles (column 3 lines 30-60; column 5 lines 40-50; columns 21-22 part g).

It would have been obvious to one with ordinary skill in the art at the time the invention was made to substitute the blend material of Winckler for the PET or PBT material used to coat / impregnate the fiber mat core structures of Dunton. The rationale to do so would have been that that the blend material of Winckler has superior processing characteristics relative to conventional thermoplastics precursors, with a stable and long shelf life, and allowing for easy production, storage, transportation and processing (Winckler: column 3 lines 30-40). By incorporating said blend material of

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Winckler into the manufacturing process of Dunton, the durability and longevity of the finished fiber-reinforced material of Dunton may be increased.

Regarding the limitations of Claims 8-11, Dunton does not expressly disclose that said first resin coat is comprised of reactive starting material containing cyclic / macrocyclic oligomers of PET, PBT, or a blend thereof.

Winckler teaches a blend of reactive starting material (comprised of macrocyclic polyester oligomers of PBT or PET, with catalyst) used to manufacture thermoplastic resin articles (column 3 lines 30-60; column 5 lines 40-50; columns 21-22 part g).

It would have been obvious to one with ordinary skill in the art at the time the invention was made to substitute the blend material of Winckler for the PET or PBT material used to initially coat the fiber mat core structures of Dunton. The rationale to do so would have been that that the blend material of Winckler has superior processing characteristics relative to conventional thermoplastics precursors, with a stable and long shelf life, and allowing for easy production, storage, transportation and processing (Winckler: column 3 lines 30-40). By incorporating said blend material of Winckler into the manufacturing process of Dunton, the durability and longevity of the finished fiber-reinforced material of Dunton may be increased.

4. Claim 12 is rejected under USC 103(a) as being unpatentable over Brambrach (5,186,999) (Brambach) in view of Winckler.

Regarding the limitations of Claim 12, Brambach teaches a method for producing a sandwich material containing a layer of core thermoplastic, foamed material sandwiched between two layers of thermoplastic sheet material reinforced with fibers (Abstract; column 3 lines 20-40). Brambach also teaches that both the foamed core material as well as the sheet materials may be made of PET or PBT (column 1 lines 50-60; column 3 lines 45-50).

Brambach does not expressly disclose that said foamed layer is connected (in the form of a laminate) to a fiber web impregnated / coated with a reactive starting material containing cyclic / macrocyclic oligomers of polyester blended with polymerization catalyst, with said reactive starting material polymerizing to form a polyester amongst the foamed layer and sheet material layers.

Winckler teaches a blend of reactive starting material (comprised of macrocyclic polyester oligomers of PBT or PET, with catalyst) used to manufacture thermoplastic resin articles (column 3 lines 30-60; column 5 lines 40-50; columns 21-22 part g).

It would have been obvious to one with ordinary skill in the art at the time the invention was made to combine the blend material of Winckler with the process of making the PET or PBT-based sandwich material of Brambach. The rationale to do so would have been that that the blend material of Winckler has superior processing characteristics relative to conventional thermoplastics precursors, with a stable and long shelf life, and allowing for easy production, storage, transportation and processing (Winckler: column 3 lines 30-40). By incorporating said blend material of Winckler into

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the manufacturing process of Brambach, the durability and longevity of the finished sandwich material of Brambach may be increased.

5. Claims 13-15 are rejected under USC 103(a) as being unpatentable over Brambrach (5,186,999) (Brambach) in view of Dunton and in further view of Winckler.

Brambach teaches that blowing agent may be used to form the foamed layer (which may be surrounded on either side with sheet material) by means of expansion with relief of pressure (column 3 lines 1-10).

Brambach does not expressly disclose that said blowing agent is connected to a reactive starting material and deposited onto an impregnated / coated fiber web by means of extrusion.

Dunton teaches that a melted first thermoplastic resin (comprised of PET or PBT) is coated or extruded onto a fiber mat core (column 2 lines 35-40; column 6 lines 5-10).

It would also have been obvious to one with ordinary skill in the art at the time the invention was made to combine the fiber core mat (coated with thermoplastic resin material) of Dunton with the blowing agent to generate a foamed layer with Brambach. The rationale to do so would have been to ultimately improve the pressure resistance of the sheet material, as the injection of PET or PBT materials with a blowing agent would accomplish (Brambach: column 2 lines 60-65; column 3 lines 1-15).

Neither Dunton nor Brambach expressly disclose that said reactive starting material is comprised of macrocyclic polyester oligomers of PBT or PET. Winckler teaches a blend of reactive starting material (comprised of macrocyclic polyester

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oligomers of PBT or PET, with catalyst) used to manufacture thermoplastic resin articles (column 3 lines 30-60; column 5 lines 40-50; columns 21-22 part g).

It would have been obvious to one with ordinary skill in the art at the time the invention was made to incorporate the disclosed blend material of reactive oligomers and polymerization catalyst of Winckler into the process of initially coating a fiber mat core of Dunton. The rationale to do so would have been that the blend material of Winckler has superior processing characteristics relative to conventional thermoplastics precursors, with a stable and long shelf life, and allowing for easy production, storage, transportation and processing (Winckler: column 3 lines 30-40). By incorporating said blend material of Winckler into the manufacturing process of Dunton, the durability and longevity of the finished fiber-reinforced material of Dunton may be increased.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VICKI WU whose telephone number is (571)270-7666. The examiner can normally be reached on M-F (8:30 am-6 pm), every other Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/VW/
Patent Examiner, GAU 4122

/Timothy J. Kugel/
Primary Examiner, Art Unit 1796